WHAT IS CLAIMED IS:

1. A method of forming a metal gate in a semiconductor device comprising the steps of:

providing a silicon substrate having one or more device isolation films of a trench shape for defining an active region;

forming a gate insulating film on the surface of said silicon substrate by means of a thermal oxidization process;

sequentially forming a barrier metal film and a metal film for the gate on said gate insulating film; and

patterning said metal film for the gate, said barrier metal film, and said gate insulating film,

wherein deposition of said barrier metal film and said metal film for the gate is performed by a process selected from a group consisting of an atomic layer deposition (ALD) process, a remote plasma chemical vapor deposition process, and a combination thereof.

2. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said thermal oxidization process is performed at a temperature in the range of 650°C through 900°C (by means of wet (H_2/O_2) or dry (O_2) method.

3. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said barrier metal film is selected from the group consisting of TiN, TiAlN, TaN, MoN and WN.

4. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said ALD process is performed using a compound selected from the group consisting of N_2, NH_3, ND_3 and a mixture thereof, as a material for purging a precursor at a temperature in the range of 50°C through 550°C under a pressure in the range of 0.05 Torr through 3 Torr.

5. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said remote plasma CVD process is performed using an electron cyclotron resonance (ECR) as a plasma source, and, a plasma excitation gas selected from the group consisting of He, Ar, Kr, Xe and a mixture thereof under a frequency in the range of 2.0 GHz through 9 GHz.

6. The method of forming a metal gate in a semiconductor device according to claim 3, wherein the barrier metal film is TiN, wherein the Ti is provided from a source selected from the group consisting of $TiCl_4$, Tetrakis (Diethylamino) Titanium, Tetrakis (Dimethylamino) Titanum and a mixture thereof; and N is provided from a source selected from the group consisting of N_2, NH_3, ND_3, and a mixture thereof.

7. The method of forming a metal gate in a semiconductor device according to claim 3, wherein the barrier metal film is TiAlN, wherein the Ti is provided from a source selected from the group consisting of $TiCl_4$, Tetrakis (Diethylamino) Titanium, Tetrakis (Dimethylamino) Titanum and a mixture thereof; and Al is provided from a source selected from the group

consisting of $AlCl_3$, $Al(CH_3)_3$, and a mixture thereof; and N is provided from a source selected from the group consisting of N_2, NH_3, ND_3, and a mixture thereof.

8. The method of forming a metal gate in a semiconductor device according to claim 3, wherein the barrier metal film is TaN, wherein the Ta is provided from a source selected from the group consisting of $TaCl_4$, tantalum tert-butaoxide, and a mixture thereof; and N is provided from a source selected from the group consisting of N_2, NH_3, ND_3, and a mixture thereof.

9. The method of forming a metal gate in a semiconductor device according to claim 3, wherein the barrier metal film is MoN, wherein the Mo is provided from a source selected from the group consisting of $MoCl_4$, MoF_6, molybdenum tert-butaoxide; and a mixture thereof; and N is provided from a source selected from the group consisting of N_2, NH_3, ND_3, and a mixture thereof.

10. The method of forming a metal gate in a semiconductor device according to claim 3, wherein the barrier metal film is WN, wherein the W is provided from a source selected from the group consisting of WF_6, WCl_4, and a mixture thereof; and N is provided from a source selected from the group consisting of N_2, NH_3, ND_3, and a mixture thereof.

11. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said metal film for the gate is selected from the group consisting of W, Ta, Al, $TiSi_x$, $CoSi_x$, $NiSi_x$, wherein x is in the range of 0.1 to 2.9, and a mixture thereof.

12. The method of forming a metal gate in a semiconductor device according to claim 1, wherein said metal film for the gate has a stacked film structure of polysilicon, a tungsten nitride film, and a tungsten film.